REMARKS

This Supplemental Amendment corrects the ascending numerical order for claim 25, responding to the Notice of Non-Compliant Amendment dated July 20, 2004.

Claims 2-4 and 20-27 are all the claims pending in the application. This Amendment amends claim 22, adds claims 23-27, and addresses each point of rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

Applicants thank the Examiner for acknowledging the claim for foreign priority under 35 U.S.C. § 119, noting that the priority documents have been received, and initialing the Information Disclosure Statement filed August 26, 2003.

Claims 2-4 and 20-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Miura *et al.* (U.S. Patent No. 4,846,541) in view of Nieh *et al.* (U.S. Patent No. 5,346,600) further in view of Tenhover *et al.* (U.S. Patent No. 5,741,403).

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case for the obviousness of subjecting silicon carbide to dry plating while controlling a concentration of a reactive gas including a nitrogen-containing gas, as required in independent claim 20.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP § 2143.03. However, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *See* MPEP §2143.01.

The Examiner asserts that "it would be obvious to a skilled artisan to modify Miura by employing nitrogen as the reactive gas as taught by Nieh because Nieh, in col. 10, lines 32-35, discloses that it is advantageous to use nitrogen as the reactive gas in reactive sputtering."

As the Examiner asserts, Nieh does disclose using nitrogen as a reactive gas during sputtering. However, as clearly emphasized in the passage cited by the Examiner at column 10, lines 32-35, Nieh employs nitrogen for the deposition of metal nitrides. *See, e.g.,* Nieh column 8, line 67 to column 9, line 2 (inert Ar^+ and reactive N_2^+ ions employed to deposit titanium nitride); Nieh column 10, lines 32-35 ("The reactive gas employed in the plasma 16 depends on the metal alloy film to be deposited. For metal nitrides, nitrogen is advantageously employed as the reactive gas.").

The context of Nieh's disclosure for using reactive nitrogen is important, because it makes clear that the Examiner has failed to identify any reasoning as to *why* someone would utilize reactive nitrogen in the process of Miura. Nieh discloses that if a metal nitride is being formed, then reactive nitrogen is advantageous. As explained on page 9 of the present application, when the reactive gas used during the sintering of silicon carbide includes a nitrogen-containing gas, the resulting film includes SiC_xN_y, or includes a mixture of SiC, Si_3N_4, SiN, and SiC_xN_y. However, Miura neither teaches nor suggests forming a silicon carbide nitride. Instead, Miura discloses a process for forming $Si_xC_yO_z$ and $Si_xO_yC_z$. The teachings of Nieh to use reactive nitrogen when forming a metal *nitride* are completely irrelevant to the objectives and processes of Miura.

In comparison, in the same passage of Nieh cited by the Examiner, Nieh clearly discloses that for forming metal carbides, a carbon-containing gas is employed. *See* Nieh column 10, lines 36-40. If a "skilled artisan" did seek to modify Miura based on Nieh, the result would to consider the use of a carbon-containing gas, not a nitrogen-containing gas.

In view of the teachings of Miura and Nieh, Applicants respectfully submit that the Examiner's justification for using reactive nitrogen with Miura must be the result of hindsight, as modifying Miura to utilize reactive nitrogen clearly is not supported by the disclosures of the references. Reconsideration and withdrawal of the rejection of claim 20 are requested.

Applicants submit that claims 2-4 and 21 are also not obvious, at least as further limitations on independent claim 20.

Further, regarding claim 21, the Examiner asserts that Tenhover "discloses that a source of an amorphous carbon, an organic resin binder, various dispersants, lubricants or diluents can be used as sintering aids." Applicants respectfully submit that this is a mischaracterization of Tenhover, which discloses only boron, aluminum, and beryillium as sintering aids. *See* Tenhover column 5, line 58; column 8, lines 50-51; and column 9, lines 6-8 and 58-60.

Tenhover does disclose that the raw-batch target can include a temporary binder which can be an organic resin. *See* Tenhover column 5, line 59, column 8, lines 52-53, and column 9, lines 52-55. Tenhover also discloses that the raw-batch target can include various dispersants, lubricants, solvents, or diluents. *See* Tenhover column 5, line 60, and column 8, lines 53-54. However, Tenhover does not characterize these organic resins, dispersants, lubricants, solvents, and diluents as "sintering aids."

Therefore, Applicants offer the following remarks on the assumption that it is the Examiner's position that the organic resins of the binder in Tenhover render obvious the non-metallic sintering aids recited in claim 21.

The Examiner asserts that "it would be obvious to a skilled artisan to modify Miura by employing the method of sintering as taught by Tenhover because Miura in col. 3, line 29, line 32, and line 58, discloses that a sintered sputter target is preferably used for sputter depositing a silicon carbide film."

Even if Miura were to be performed using aspects of Tenhover's sputtering process, one of ordinary skill in the art looking to Tenhover for ways of forming the amorphous films achieved by Miura would omit Tenhover's organic resin temporary binder from process.

Tenhover discloses a process resulting in amorphous SiC_x wherein there is more molar carbon than silicon (*i.e.*, x>1). *See, e.g.,* Tenhover column 3, lines 46-55 ("the invention concerns a substrate comprising a non-oxide ceramic base with a substantially amorphous smoothing layer of silicon carbide thereon.... The smoothing layer is comprised of amorphous silicon carbide corresponding to the formula SiC_x wherein x is the molar ration of carbon to silicon and is greater than 1, preferably about 1.1 to less than about 1.45").

This intentional abundance of carbon in Tenhover results from, among other things, the use of the organic resin binder. *See* Tenhover column 9, lines 52-57 ("The temporary binder can also contribute to the amount of carbon present in the sintered body and must be considered when determining the proportions of raw materials to obtain a desired value of x.").

In comparison, *none* of the amorphous SiCO or SiOC films in Miura achieving a refractive index ranging from 1.4 to 2.8 includes more molar carbon than silicon. Based on the disclosures of Miura and Tenhover, if one of ordinary skill were trying to fabricate optical films made primarily of silicon carbide and having a refractive index ranging from 1.4 to 2.8, then in order to achieve the result-effective molar ratios disclosed in Miura, Tenhover's organic resin temporary binder would not be utilized in order to minimize an increase in molar carbon in the resulting optical films.

Applicants respectfully submit that since the organic resin would be omitted from the process, the combination of Miura and Tenhover is irrelevant to the limitations of claim 21.

Claim 22 is amended to delete "rectangular wave" from the recited refractive index wave forms. Applicants respectfully submit that the applied art does not disclose the triangular wave and sine wave patterns recited. Reconsideration is requested.

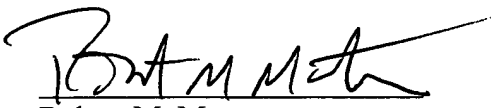
Applicants add new claims 23-27, each of which recites (or otherwise includes) that the thin film comprises SiC_xN_y. No new matter is added. Applicants have included that $x > 0$ and $y > 0$ for clarity, as this is implicit in the discussion of x and y on page 9 of the application (x and y are described as *arbitrary numbers*; if either x or y is zero, there is no reason to indicate that SiC_xN_y is included in a mixture with SiC and SiN; therefore, x and y are implicitly non-zero numbers). Applicants submit that these claims readily distinguish over the applied art, and ask for entry and consideration of the new claims on the merits.

In view of the above, reconsideration of this application is now believed to be in order, and such actions is hereby solicited. If any points remain in issue which the Examiner feels may

be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Robert M. Masters
Registration No. 35,603

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: July 27, 2004